Model Card

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| **Property** | **Decision Tree** | **Naive Bayes** | **K-Nearest Neighbour** | **Logistic Regression** | **Support Vector Machine (SVM)** |
| 1. Parametric/Non-parametric | Non-parametric | Parametric | Non-parametric | Parametric | Parametric (Linear SVM) / Non-parametric (Kernel SVM) |
| 2. Input | Both continuous and discrete | Both continuous and discrete | Both continuous and discrete | Both continuous and discrete | Both continuous and discrete |
| 3. Output | Discrete (classification) or continuous (regression) | Discrete (classification) | Discrete (classification) or continuous (regression) | Discrete (classification) | Discrete (classification) |
| 4. Handle Missing Value | Yes, can handle through surrogate splits | No, needs preprocessing | No, needs preprocessing | No, needs preprocessing | No, needs preprocessing |
| 5. Model Representation | Hierarchical tree structure with nodes and branches | Probabilistic model based on Bayes theorem | Instance-based model using distance metrics | Linear decision boundary | Linear or non-linear decision boundary with maximum margin |
| 6. Model Parameters | Splitting criteria, max depth, min samples per leaf, etc. | Prior probabilities, conditional probabilities | Number of neighbors (k), distance metric | Coefficients (weights), regularization parameter | Kernel, regularization parameter (C), kernel parameters |
| 7. Make the Model More Complex | Increase max depth, reduce min samples per leaf, reduce pruning | Use kernel density estimation instead of parametric distributions | Decrease k (fewer neighbors), use more complex distance metrics | Add polynomial features, reduce regularization | Use more complex kernels (polynomial, RBF) |
| 8. Make the Model less Complex | Reduce max depth, increase min samples per leaf, increase pruning | Use simpler distribution assumptions | Increase k (more neighbors), use simpler distance metrics | Increase regularization (L1 or L2), feature selection | Increase C, use simpler kernels (linear) |
| 9. Interpretability/Transparency | High interpretability (can visualize decision rules) | Moderate interpretability (can examine probabilities) | Low interpretability (black box) | High interpretability (can examine coefficients) | Low interpretability with non-linear kernels, moderate with linear kernel |